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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,082	02/21/2002	Joseph S. Shabtai	NREL 01-01 CIP	9869

7590 05/31/2005

Paul J. White
National Renewable Energy Laboratory
1617 Cole Blvd.
Golden, CO 80401

EXAMINER	
NGUYEN, TAM M	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/080,082	SHABTAI ET AL.	
	Examiner	Art Unit	
	Tam M. Nguyen	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25,27-42,44-48 and 50* is/are pending in the application.

4a) Of the above claim(s) *33-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25,27-32,39-48 and 50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 8 and 9 are objected to because of the following informalities: the word "napthenes" in line 2 of the claims is misspelled. It should be spelled as --naphthenes--.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-16, 19, 21-25, 27-32, 39-42, and 44-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shabtai et al. (5,959,167) in view of either Jelks (5,770,010) or Lucas et al. (5,735,916).

Shabtai'167 discloses a process for converting lignin into high-quality reformulated hydrocarbon gasoline compositions. A lignin material containing water from a biomass (e.g., Kraft lignins) is subjected to a base catalyzed depolymerization reaction to produce a depolymerized lignin product which is subjected to a hydroprocessing reaction zone (e.g., dehydrodeoxygenation and hydrocracking) to produce a final product which comprises monocyclic aromatic hydrocarbons (e.g., C_7-C_{10} alkylbenzene) and naphathene. The depolymerization reaction is operated at a temperature of from 250 to 310° C in the presence of a dilute alkali hydroxide solution containing about .5 to 10 wt. % of NaOH and alcohol and water. The dehydrodeoxygenation reaction is employed a MMo/Al_3O_2 catalyst and the hydrocracking reaction zone is employed a sulfided MMo/SiO2-Al_2O_3 catalyst wherein M is Co, Ni, Ru, Ir, Pt, Fe, or Rh. The hydroprocessing is operated at a hydrogen pressure of from 1400 to 2200 psig and at a temperature of from 350-390° C. It is noted that Shabtai'167 does not specifically disclose that the blend component has an octane number of about 110 or higher. However, the blend component of Shabtai is produced from a process which is essentially the same as the claimed process. Therefore, it would be expected that the blend component of Shabtai would have the octane number as claimed. (See col. 6, lines 19-34; col. 7, line 14 through col. 10, line 62; col. 11, lines 19-36)

Shabtai'167 does not disclose a step of extracting lignin from a biomass.

Both Jelks and Lucas disclose process for extracting lignin from a biomass. (See Jelks, abstract; See Lucas, col. 2, lines 25-35)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Shabtai by using a lignin feedstock from either the Jelks or Lucas process because Shatai'167 teaches that the lignin feedstock can be derived from any method of production (See col. 7, lines 59-61)

Shabtai'167 does not disclose an amount of lignin in the biomass.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Shabtai by using a biomass comprising the claimed amount of lignin because it appears that any high percentage of lignin containing biomass can be used in the process of Shabtai'167 (see col. 6, lines 55-63). Therefore, it would be expected that the results would be the same or similar when using the claimed amount in the process of Shabtai'167 process.

Shabtai'167 does not disclose that the second composition comprises about 5 to 40% alkyl naphthenes or 75-95% of alkylbenzenes. However, the process of Shabtai'167 is similar to the claimed process in terms of feedstock, deplolymerizing, and hydroprocessing. Therefore, it would be expected that the second composition of Shabtai'167 would comprise about 5 to 40% alkyl naphthenes or 75-95% of alkylbenzenes.

Shabtain'167 does not disclose the liquid hourly space velocity (LHSV) of the lignin feedstock.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Shabtain'167 by using the claimed LHSV because it is within the level of one of skill in the art to operate the process at any effective LHSV including the claimed LHSV.

Shabtain'167 does not specifically disclose step of dispersing a lignin-containing feedstock in an aqueous reaction medium.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Shabtain'167 by dispersing the lignin feedstock to an aqueous reaction medium because Shabtain'167 teaches that the lignin feedstock is be mixed with water and how lignin is mixed with water would affect the outcomes of the process.

Claims 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claim 1 above, and further in view of Shabtai (6,172,272).

Shabtai'167 does not disclose that the depolymerization is carried out in the presence of a CsX-type zeolite as a superbase catalyst.

Shabtain'272 discloses a depolymerization process wherein a CsX-type zeolite superbase catalyst is used in combination with alkali hydroxide (see col. 5, line 54 through col. 6, line 6)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Shabtai'167 by using a CsX-type zeolite superbase catalyst as taught by Shabtain'272 because Shabtain'272 teaches that the zeolite superbase catalyst has an equivalent function as a catalyst-solvent system.

Response to Arguments

The argument that, in the depolymerization step, the present invention process utilizes water as a reaction medium whereas the process of Shabtai'167 employs a supper critical solvent reaction medium is not persuasive because Shabtai'167 teaches that it is an advantage of the invention that the reaction medium may contain water (see col. 7, lines 26-36). It is reminded that the claimed process does not exclude the use of other reaction mediums such as a supper critical solvent.

The argument that there is no reference to or mention of suitability of the final product as a blend in petroleum based fuel is not persuasive because Shabtai'167 teaches that the final product can be used as blending components in petroleum-derived reformulated gasolines. (See col. 11, lines 31-37)

The argument that Lucas does not teach a depolymerization process of a lignin or subsequent hydroprocessing to provide a hydrocarbon suitable as a blend in petroleum derived fuel is not persuasive because the examiner relied upon Lucas to teach that a lignin feedstock is usually derived from a biomass by an extraction technique.

The argument the Shabtai' 272 does not teach the use of water as a reaction medium is not persuasive because the examiner relied upon Shabtain'272 to teach a depolymerization process wherein a CsX-type zeolite superbase catalyst is used.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam M. Nguyen
Examiner
Art Unit 1764

TN

Tam 5/26/05